

REMARKS

Claims 7-19 are pending in the above identified application. The Examiner has rejected claims 7-19, the present rejection being based on art not previously presented by the Examiner. The Examiner has rejected claims 7-19 under 35 U.S.C. § 103(a) as being allegedly unpatentable over applicant's admitted prior art (AAPA) in view of Ishaque (U.S. 5,288,989) and Possin (U.S. 5,777,355). Applicants herein traverse these rejections.

I. The prior art does not teach all of the elements of the claims

The prior art cited by the Examiner does not teach "depositing a first passivation layer over the plurality of source-drain metal contacts and the substrate; depositing a second passivation layer that suppresses lateral leakage current over the first passivation layer," as is recited in claim 7, "depositing a first passivation layer over the plurality of source-drain metal contacts and the substrate; depositing a second passivation layer over the first passivation layer that suppresses lateral leakage current" as is recited in claim 11, or "depositing a first passivation layer over the source-drain metal contact; depositing a second passivation layer over the first passivation layer," as is recited in claim 16.

As the Examiner has previously admitted "the AAPA does not discuss using a second passivation layer overlying the first passivation layer to prevent the conducting channels from forming between two pixel electrodes" (Office Action mailed March 4, 2003, pgs 2-3). Therefore, according to the admission by the Examiner, the AAPA does not teach "depositing a first passivation layer over the plurality of source-drain metal contacts and the substrate; depositing a second passivation layer that suppresses lateral leakage current over the first passivation layer," as is recited in claim 7 or "depositing a first passivation layer over the plurality of source-drain metal contacts and the substrate; depositing a second passivation layer

over the first passivation layer that suppresses lateral leakage current” as is recited in claim 11.

Ishaqui does not cure the defects in the teachings of the AAPA.

Ishaque teaches “[a]n avalanche photodiode (APD) [with] a two tier passivation layer disposed over the silicon APD body.” (Ishaque, abstract). Ishaque describes that “an avalanche photodiode (APD) includes an APD body, a bottom contact pad, a top contact pad, and a two-tier passivation layer.” (Ishaque, col. 3, lines 26-29). As further taught in Ishaque, “[t]he two-tier passivation layer is disposed over the APD body so as to cover the outer periphery of the APD body except at a selected contact area with the top contact.” (Ishaque, col. 3, lines 42-45). Therefore, neither the AAPA nor Ishaque teaches “depositing a first passivation layer over the plurality of source-drain metal contacts and the substrate; depositing a second passivation layer that suppresses lateral leakage current over the first passivation layer,” as is recited in claim 7, “depositing a first passivation layer over the plurality of source-drain metal contacts and the substrate; depositing a second passivation layer over the first passivation layer that suppresses lateral leakage current” as is recited in claim 11, or “depositing a first passivation layer over the source-drain metal contact; depositing a second passivation layer over the first passivation layer,” as is recited in claim 16.

Furthermore, Possin fails to cure the defects in the teachings of the AAPA and Ishaque. Possin fails to disclose or suggest a second passivation layer to suppress lateral leakage current.

Claims 7 and 11 are therefore allowable over AAPA in view of Ishaque and Possin. Claims 8 through 10 depend from claim 7 and are therefore allowable over this art for at least the same reasons as is claim 7. Claims 12 through 15 depend from claim 11 and are therefore allowable for at least the same reasons as is claim 11. Claims 17-19 depend from claim 16 and are therefore allowable for at least the same reasons as is claim 16.

II. There is no motivation to combine the AAPA and Ishaque.

There is no motivation to combine the AAPA teachings with the teachings of Ishaque as is suggested by the Examiner. Ishaque teaches away from “depositing a continuous layer of i a-Si disposed on the second passivation layer and the first doped a Si layer” as is recited in claim 7, “depositing a continuous layer of i a-Si disposed on the second passivation layer and over the first doped a-Si layer” as is recited in claim 11, or “depositing sensor material comprising a continuous layer of i a-Si over the collection electrode and at least a portion of the second passivation layer” as is recited in claim 16.

Instead, Ishaque teaches that an amorphous silicon layer can not be utilized as a photosensitive material because of the cure temperature required to drive moisture away during deposition and curing of the passivation layer that is utilized as the moisture barrier layer. In particular, Ishaque teaches that

in devices in which amorphous silicon comprises the photosensitive semiconductive material, constraints of temperature in the formation process relative to the optimal cure temperature for the polyimide make it undesirable to place the polyimide immediately adjacent to the photosensitive material. Specifically, the maximum temperature to which the amorphous silicon structure can be exposed in the fabrication process without damaging the semiconductor material is about 250 °C, thus limiting the cure temperature of the polyimide and preventing all moisture from being driven out of the polyimide. Thus the moisture inherent in the polyimide itself contaminates the amorphous silicon structure.

(Ishaque, col. 3, lines 2-15). Further, Ishaque teaches, with respect to its own disclosure, that

[t]he crystalline silicon comprising APD body 120 is able to withstand the high cure temperature without adversely affecting the performance of the completed device. Photosensors that comprise amorphous silicon are much more sensitive to the heat, and as a consequence the cure temperature must be kept at a

relatively low temperature level that precludes all residual moisture in the material from being driven out during the curing process. As a consequence, in amorphous silicon based photosensors, the organic dielectric layer cannot advantageously be disposed adjacent to the photosensitive semiconductive material comprising the photosensitive body because the residual moisture leaches into the photosensitive material and causes degradation of photosensor performance.

(Ishaque, col. 5, lines 33-47). Therefore, according to the teachings of Ishaque, amorphous silicon should not be utilized in the structure at all. Therefore, Ishaque teaches away from an amorphous silicon layer “disposed on the second passivation layer” as is recited in each of independent claims 7, 11, and 16.

Applicants further maintain that the Examiner is citing non-analogous art against the claims of the application. The structural and material differences between photo-diode structures and Applicants’ full fill-factor imaging arrays are too different to expect one of ordinary skill in the art, even knowing of the teachings of Ishaque, to look to Ishaque for processes and structures that relate to a full-fill imaging array. Further, there is no motivation to combine Possin with Ishaque or the AAPA. It appears that the Examiner is utilizing impermissible hindsight in order to combine art such as Ishaque with the AAPA.

As is discussed above, there is no motivation to combine Ishaque with the AAPA in the fashion suggested by the Examiner. As discussed, Ishaque teaches away from aspects of the invention claimed in claims 7, 11, and 16. Furthermore, modification of Ishaque in the fashion suggested by the Examiner result in the invention of Ishaque becoming inoperable for its intended purpose, as taught in Ishaque itself. Therefore, Applicants respectfully request that the Examiner reconsider the rejections of claims 7 through 19 based on this art.

Conclusion

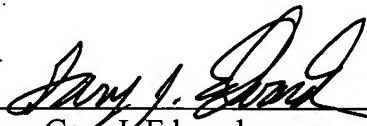
In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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